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1986

# Phosphorus and Water Quality in the Flathead Basin

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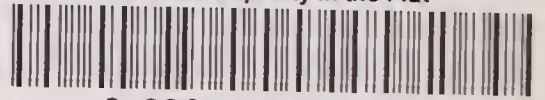


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# Phosphorus and Water Quality in the Flathead Basin

*The economic value of preserving the water quality and recreational use of the Flathead Basin area has been estimated at \$100 million per year.*

Flathead River Basin  
Environmental Impact Study



# Increased Growth... and Resources at Risk

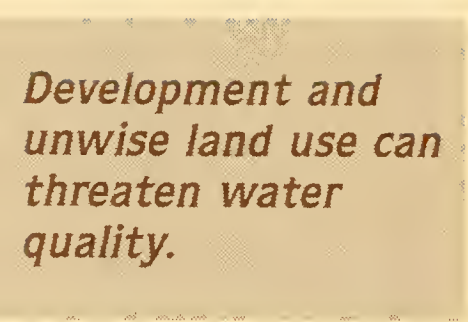
Flathead Lake is recognized as one of the most attractive locations in America. The area's crystal-clear waters, majestic mountains and abundant fish and wildlife have held Montanans and visitors spellbound for over a century.

Through those 100 years, the Flathead Basin has undergone sizeable growth and development. Numerous towns and smaller communities have been established near Flathead Lake. The area has become an integral part of the lives and lifestyles of nearly 100,000 people who were attracted to its pristine waters, wildlife and mountain beauty.

This growth and development has brought with it, however, increased pressures on the rich natural resources of the area—pressures which have begun to compromise the aesthetic beauty and the water quality of the Flathead Basin.

While lakeshores and streambanks offer appealing places for homes, recreational facilities and towns, intensive development and unwise land use within a watershed (an area that drains water to a central basin) can also threaten water quality.

Causes of deteriorating water quality include accelerated runoff, erosion, stormwater and sewage drainage, and alterations of slope, soil, chemistry or vegetation. Controlling these threats to water quality requires sound land use management practices, stable watersheds and proper municipal waste treatment.



# Flathead Lake Faces Premature Aging

All lakes go through a normal, almost imperceptible aging process called eutrophication. A young lake is clear and relatively free of plant nutrients. An old lake becomes green from an overabundance of these nutrients.

Reaching “old age” (the eutrophic phase) for a lake as large as Flathead Lake would usually take thousands or even millions of years. This natural aging process can, however, be hastened by human activities. Recent algal “blooms” (excessive growth of algae) in Flathead Lake signal increased nutrient levels and premature aging of the lake.

*Recent algal ‘blooms’ in Flathead Lake signal premature aging of the lake.*

## Phosphorus — A Key Problem in Flathead Lake

Phosphorus is one of many nutrients essential to life. Phosphorus is found in volcanic rocks, sediments, soil, precipitation, fertilizers, and human and animal wastes. It is also a common component of many laundry detergents.

Some phosphorus occurs naturally in all lakes, but even a small amount of excess phosphorus can overfertilize a lake. Algae respond quickly to an increase in phosphorus, growing rapidly and forming green slimy mats that spread across the water surface. This increased algal growth lowers water quality and can give the water a foul taste and odor. In a relatively short time, the entire lake can be affected.



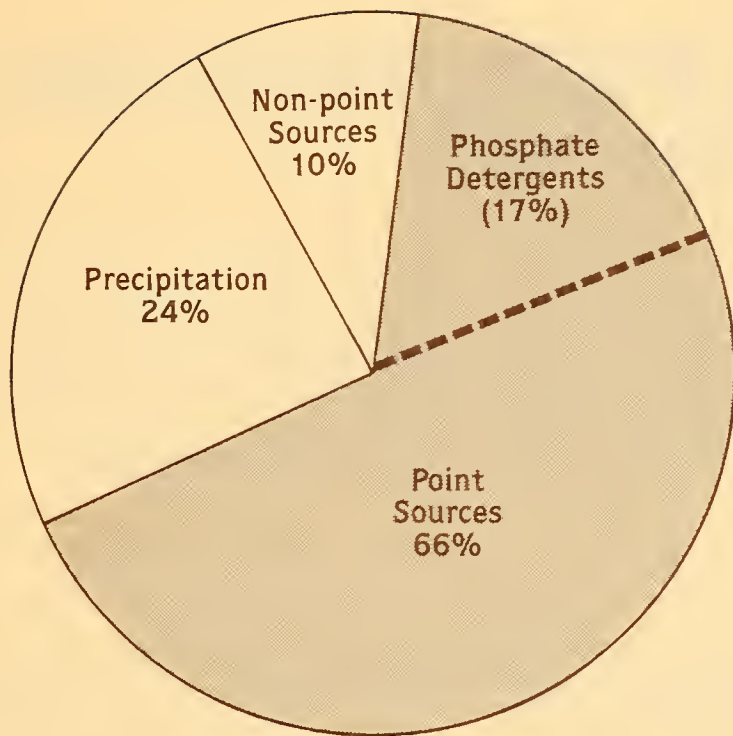
# Where Phosphorus Comes From

Phosphorus enters Flathead Lake from both point sources, such as wastewater treatment plants, and non-point sources, such as runoff from agricultural land. Most of the phosphorus that naturally enters Flathead Lake is in a form that is not capable of stimulating algal growth, so it just settles to the bottom of the lake.

A portion of the phosphorus entering the lake, however, is capable of stimulating the growth of algae. This "available" phosphorus comes from three main sources:

- The first source is precipitation (rain and snow) and particles of smoke, pollen and dust that settle on the lake surface.
- The second is non-point sources, which include land and streambank erosion during spring snowmelt. Another non-point source is surface water recharge by groundwater which may be contaminated by septic tank drainfields.
- The third main source represents two-thirds of the phosphorus entering Flathead Lake. This last—and greatest—source is effluent from community wastewater treatment plants. Since most human-related phosphorus (such as that from sewage treatment) is in a form "available" to algae, population growth in the Flathead Basin contributes directly to the increasing nutrient load in Flathead Lake.

*Phosphorus comes from three main sources.*



Source: Flathead Lake Biological Station  
University of Montana

### *Human-related sources of “available” phosphorus entering Flathead Lake.*

A major source of phosphorus is laundry detergents, which account for about one-fourth of all phosphorus found in sewage treatment plants and private septic drainfields. (About half the population in the Flathead Basin is served by municipal wastewater treatment facilities; the other half depends on individual septic tanks and drainfields.) At this time, most domestic (human waste) phosphorus and virtually all detergent phosphorus disposed of through sewer systems gets into Flathead Lake. A smaller but unknown amount of detergent and domestic phosphorus enters Flathead Lake (and other lakes in the Basin) from drainfields.

These human-related sources of phosphorus, whether from municipal sewage or from land use practices on agricultural lands or timberlands, pose a very real threat to the ecological balance of Flathead Lake.

***These human-related sources of phosphorus pose a very real threat to Flathead Lake.***

# What Is Being Done To Help Flathead Lake?

A plan is in place to slow the premature aging of Flathead Lake. Developed by the Montana Department of Health and Environmental Sciences, the plan's recommended actions include:

- 1) Imposing a one-part-per-million effluent limit for phosphorus on all sewage treatment plants currently discharging into Flathead Lake or its tributaries.
- 2) Developing wastewater management plans for unsewered Basin communities.
- 3) Recommending legislation to allow the sale of only low-phosphorus or phosphorus-free laundry detergents.
- 4) Strengthening controls on non-point sources of phosphorus.
- 5) Requiring subdividers to evaluate the phosphorus-filtering capacity of soils wherever drainfields would be sited near surface water.
- 6) Expanding and refining the phosphorus monitoring program in the Basin.

This plan does not single out any one source of phosphorus; instead, it seeks to limit all controllable sources. Not only is this comprehensive approach equitable and fair, it is also essential to making any headway against the accelerating eutrophication of Flathead Lake.



Progress is being made on each of the six elements of the phosphorus-reduction strategy. Essential to making the plan work is cooperation—and in some cases increased financial costs—among local, state and federal governmental agencies, Basin residents, citizen groups, businesses and others. Each part of the plan is equally important to its overall success, and equal effort is needed to carry out each of the six action steps.

## Phosphorus Control: Insuring a \$100 Million-Per-Year Investment

It's only a matter of time before the phosphorus problem in the Flathead Basin reaches a point of no return—or, at best, a point of very expensive return. Action taken now will cost much less than the same action (or more drastic action) in the near future. Very few things become cheaper as time passes.

The economic value of preserving the water quality and recreational use of the Flathead Basin area has been estimated at \$100 million per year. Clear water and a highly prized, self-sustaining native trout fishery are two features that make this resource so valuable. Both will be lost if premature aging of the lake continues unchecked.

*Action taken now  
will cost much less.*

## Working Together on Shared Concerns

Although divided by political boundaries, lakes and rivers within the entire Basin are interrelated and share similar water concerns. Because action in one part of the Basin affects the whole Basin, the entire region must be considered as a whole when making decisions.

Coordinated Basin decision-making and management are critical to resolving problems fairly and effectively. Such coordinated management depends on the support and involvement of all Basin residents to maintain the water quality of the region.

## We All Have Choices To Make

*Basin citizens need  
to join forces.*

We who live, work and play in the Flathead Basin must recognize the need to modify our actions. We all share responsibility for the Basin. We all have choices to make. We can either protect the lake, or we can allow the lake to deteriorate, which will erode the attractiveness and the economic base of the region. Flathead Basin citizens need to join forces with friends and neighbors to share concerns and seek Basin-wide solutions for protecting the Flathead's valuable water resources.

The future of the Flathead is our future. The future of the Flathead is tied to its water quality—quality which will affect real estate values, public health, business and recreational opportunities, fish and wildlife populations, and the economic well-being of this majestic region. The actions we take today—as individuals, as citizen groups and as professional water managers—will determine the future of the Flathead Basin.

# The Flathead Basin Commission

The Flathead Basin Commission was established by the 1983 Montana Legislature to protect the quality of Flathead Lake's aquatic environment, waters that flow into or out of the lake, and other natural resources of the Basin.

The Commission is made up of representatives of federal, state, local, Canadian and tribal agencies, as well as private interests. The Commission is charged with the following tasks:

- monitoring the Basin's natural resources;
- encouraging cooperation among Basin land managers;
- holding public hearings on the condition of the Basin;
- supporting economic development without compromising the Basin's aquatic system;
- promoting cooperation between Montana and British Columbia on resource development in the Flathead Basin;
- making recommendations to the Legislature regarding the preservation of the Basin's aquatic resources.

For more information on the Flathead Basin Commission or for additional copies of this brochure, contact:

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